D1

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
29 November 2001 (29.11.2001)

PCT

(10) International Publication Number
WO 01/91065 A1

(51) International Patent Classification[7]: G07D 11/00

(21) International Application Number: PCT/GB01/02238

(22) International Filing Date: 22 May 2001 (22.05.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0012770.4 25 May 2000 (25.05.2000) GB

(71) Applicant *(for all designated States except US)*: **THOMAS FINDLAY (HOLDINGS) LIMITED** [GB/GB]; PO Box 14559, Kinross KY13 9WB (GB).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **HAY, John, Findlay** [GB/GB]; 11 Park Road, Hampton Wick, Kingston upon Thames KT1 4AS (GB). **COWLING, Michael, James** [GB/GB]; 9 Hazel Close, Bumbridge, Harrogate, North Yorkshire HG3 1NB (GB). **VANCE, Carol, Anne** [GB/GB]; Dunhoy, Main Street, Kinnesswood, Perthshire KY13 9HN (GB).

(74) Agent: **PACITTI, Paolo**; Murgitroyd & Company, 373 Scotland Street, Glasgow G5 8QA (GB).

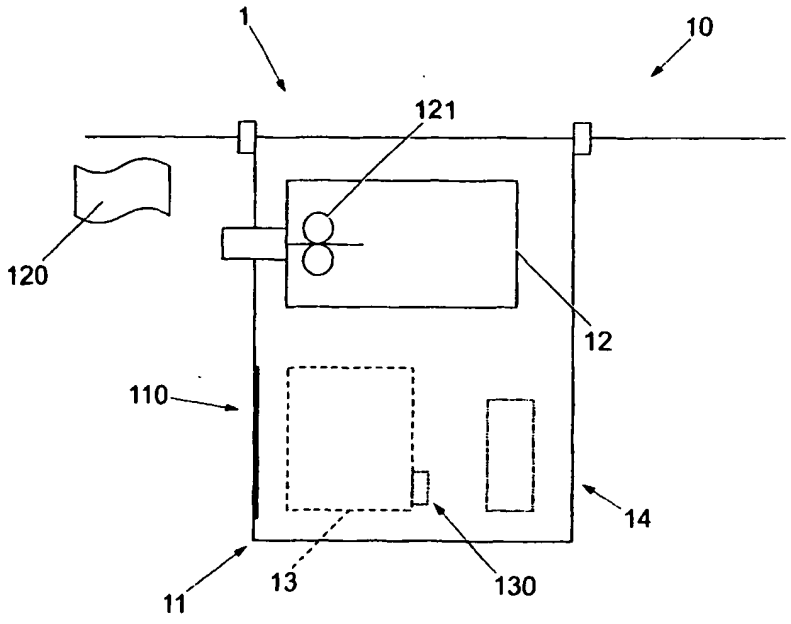
(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

[Continued on next page]

(54) Title: BANKNOTE HANDLING SYSTEM



(57) Abstract: A banknote handling unit (10) located at a point of sale accepts banknotes via a verifier and stacker (12), which stacks the notes in a cassette (13). The cassette (13) has a non-volatile memory element (130) which stores details of the number and value of notes within the cassette at any time. The cassette (13) is removable, and can only be opened and unloaded at a secure location, where the contents are checked against the record in the memory (130).

WO 01/91065 A1

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

"Banknote Handling System"

This invention relates to a banknote handling system. More specifically, the invention relates to a system which allows verification and secure handling of banknotes in retail and similar environments.

Retailers require to accept a variety of denominations of banknote at high speed. They ideally want to eliminate suspect notes immediately and store high denominations securely in an undercounter "vault" rather than in the cash register.

Conventional solutions involve UV forgery detection of forgery checking pen plus operator judgement then placement of note into "vault" hopper and operator activation of lever to stack note into vault.

It is an object of the present invention to provide a banknote handling system which obviates or

mitigates the disadvantages of previously proposed systems.

According to the present invention there is provided a banknote handling system comprising: banknote verifying means adapted to input banknotes and verify the integrity of a banknote; means to pass the checked banknote to a secure cassette: and means associated with the cassette to record the value and status of the notes checked by the verifying means.

Preferably, the record means is integral with the cassette.

Preferably, the verifying means also effects stacking of the banknotes.

Preferably, the secure cassette, together with the record means are removable for subsequent emptying and resetting.

The system also includes means for interrogating the record means.

Preferably, the handling system is located at a point of sale.

Preferably, the removable cassette can only be opened at a remote secure site.

The invention also provides a cassette for use in the foregoing system, the cassette comprising a

secure housing formed to receive banknotes one at a time and sealable against unloading, the cassette also comprising non-volatile memory means for receiving and storing data defining the number and value of banknotes inserted into the cassette.

A further aspect of the invention resides in a method of handling banknotes comprising: receiving banknotes at a point of sale, passing the banknotes one at a time through banknote verifying means into a cassette at the point of sale, storing data relating to the value and number of banknotes in a memory integral with or attached to the cassette, transporting the cassette to a secure site, and opening the cassette at the secure site.

Embodiments of the present invention will now be described, with reference to the accompanying drawings, in which:-

Fig. 1 illustrates schematically a banknote handling system made in accordance with the present invention, illustrating a point of sale installation.

Fig. 2 illustrates the system in use at a secure, remote, emptying site; and

Fig. 3 is a block diagram illustrating a signal processing means for the record means mounted on the cassette.

Referring to the drawings, a banknote handling system comprising a unit 10 mountable at a point of sale designated generally at 1. The unit 10 comprises a housing 11 which carries a banknote verifying unit 12, a removable secure cassette 13 and a data processing unit 14.

The bank note verifying unit 12 is adapted to receive banknotes 120 and includes motorised means 121 for handling the banknote 120, verifying its status and effecting stacking of the banknote.

Banknote verifying units of this type are known *per se* being used, for example, in vending machines and accordingly will not be further described herein.

The verifying unit 12 passes the checked, counted and stacked banknotes to a secure removable cassette 13 mounted in the housing 11 behind a lockable door 110. The removable cassette is equipped with record means in the form of a non-volatile memory device 130 which receives from the verifying unit 12 the number and value of the notes stacked in the cassette, and maintains a running total. As the memory device 130 is mounted on the cassette, the information relating to the value of the notes travels with the cassette and can thus be externally read, thus avoiding the need to open the cassette at any stage prior to the final secure counting station.

The non-volatile memory device 130 is provided with a unique serial number which identifies the location of the cassette. The unit is provided with a data processing system 14 which allows information to be made available at a point of sale.

Accordingly, as banknotes are fed into the cassette 13 after being processed by the verifying unit 12, the appropriate information is stored in the non-volatile memory device 130 which thus carries complete data of the number and value of the notes in the cassette 13.

Referring no to Fig. 2, there is illustrated a system for interrogating the cassette in, for example, a cash office after the cassette has been removed from the point of sale unit. The sealed cassette, removed from the point of sale unit, is passed to a reader/writer unit 20 which interrogates the memory device 130 for further processing.

Alternatively, the cassette data may have already been interrogated where the vault reader/writer electronics is fitted with the optional communications interface.

The unopened cassette 13 can be deposited in a safe for uplifting by the bank or security company. The unique identifier number of each cassette identifies the retailer, branch number and cash register number from which the cassette came, without the need for accompanying paperwork.

Once the cassette 13 is opened (usually by the bank or security company) and the banknotes removed, the memory device 130 may be "cleared" by use of the reader "wand" or by means of a command sent on the vault communications port once the cassette 13 is re-inserted in the vault.

The banknote handling system of the present invention has significant advantages to the retailer.

- automating the verification and stacking of banknotes at Point of Sale (POS)
- counting the notes automatically at POS
- allowing a locked or sealed, secure, identifiable and reusable cassette to be taken direct from POS to bank
- tracking of a cassette to an individual retailer, branch, register and operator is possible by virtue of unique serial number carried in every non-volatile memory device
- vaults may be interfaced to the retailers POS system to provide continuous, on-line data.

Optionally, the vault may be fitted with a communications port to allow direct connection to the retailers' central systems, to a network or to a hand held device thus allowing access to the cassette memory data without removal of the cassette from the vault.

Modifications and improvements mat be incorporated without departing from the scope of the invention, for example:

a) The interface between the vault reader/writer electronics and the memory device attached to the cassette may involve physical contacts, a wireless or inductive contactless system, an optical link or any other suitable interface.

b) The external communications interface of the reader/writer electronics may be a conventional serial or parallel interface, a network port (such as RS485 or Ethernet) or an optical links (such as IrDA).

c) The reader wand may be a "cradle" into which the cassette is placed, a hand-held device, or any suitable apparatus.

d) The reader wand may be fitted with a printer to allow the cassette data to be printed as, for example, a receipt or audit trail.

CLAIMS

1. A banknote handling system comprising: banknote verifying means adapted to input banknotes and verify the integrity of a banknote; means to pass the checked banknote to a secure cassette: and means associated with the cassette to record the value and status of the notes checked by the verifying means.

2. A banknote handling system according to claim 1, in which the record means is integral with the cassette.

3. A banknote handling system according to claim 1 or claim 2, in which the verifying means also effects stacking of the banknotes.

4. A banknote handling system according to any preceding claim, in which the secure cassette together with the record means are removable for subsequent emptying and resetting.

5. A banknote handling system according to any preceding claim, further including means for interrogating the record means.

6. A banknote handling system according to any preceding claim which is adapted to be located at a point of sale.

7. A banknote handling system according to claim 6, in which the removable cassette can only be opened at a remote secure site.

8. A cassette for use in the system of any preceding claim, the cassette comprising a secure housing formed to receive banknotes one at a time and sealable against unloading, the cassette also comprising non-volatile memory means for receiving and storing data defining the number and value of banknotes inserted into the cassette.

9. A method of handling banknotes comprising: receiving banknotes at a point of sale, passing the banknotes one at a time through banknote verifying means into a cassette at the point of sale, storing data relating to the value and number of banknotes in a memory integral with or attached to the cassette, transporting the cassette to a secure site, and opening the cassette at the secure site.

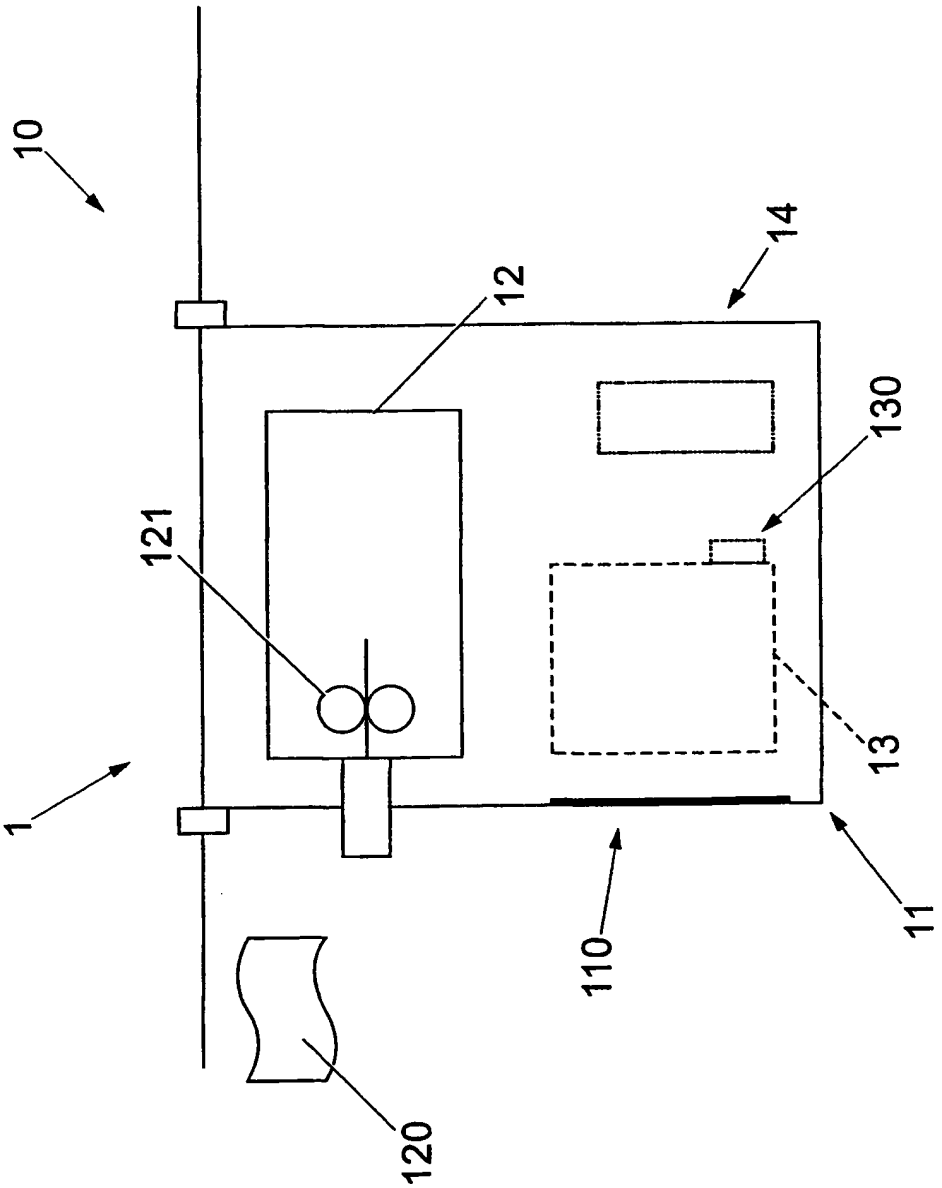


Fig. 1

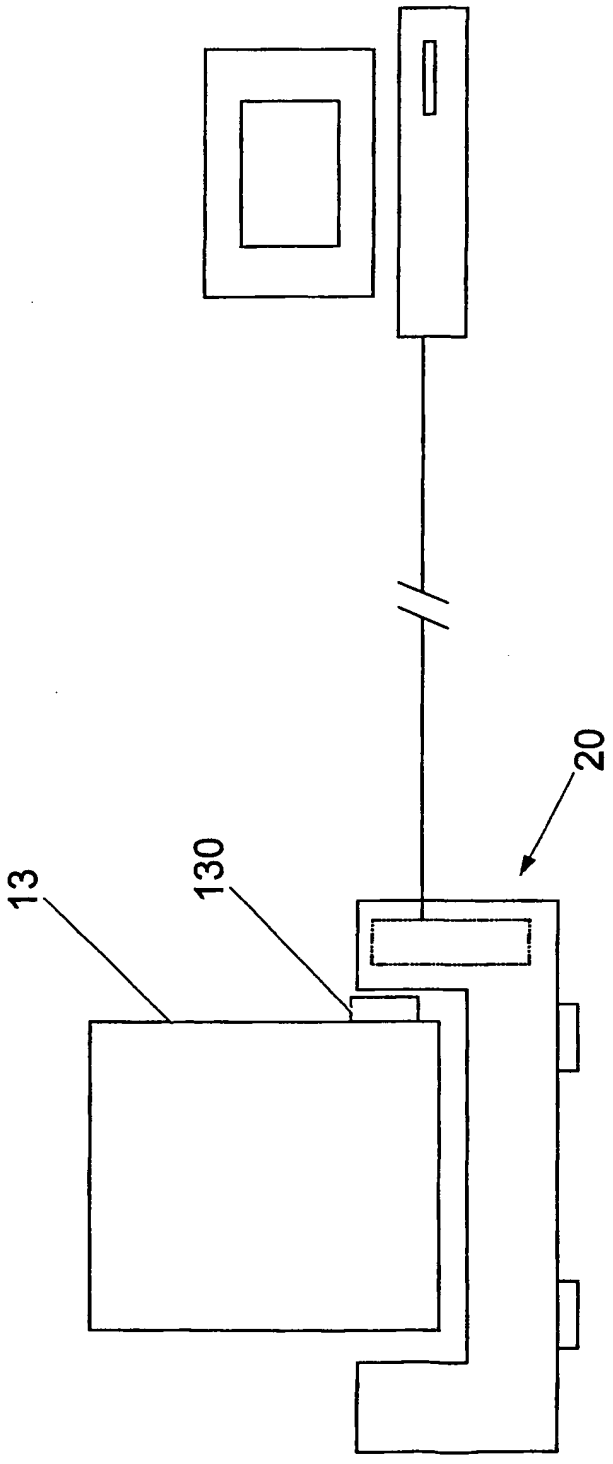


Fig. 2

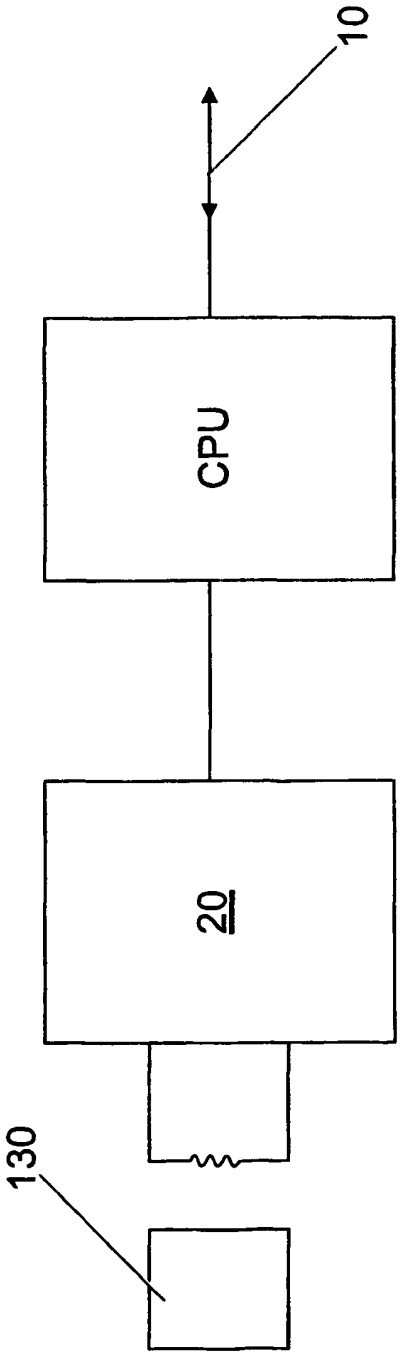


Fig. 3

INTERNATIONAL SEARCH REPORT

Inte ›nal Application No
PCT/GB 01/02238

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 G07D11/00

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 G07D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 4 977 583 A (GORGONE ROBERT L) 11 December 1990 (1990-12-11) the whole document	1-9
X	US 5 730 271 A (SCHWARTZ VLADIMIR A ET AL) 24 March 1998 (1998-03-24) the whole document	1-9
X	US 5 975 274 A (NOVAK FRANK A ET AL) 2 November 1999 (1999-11-02) column 3, line 8 -column 4, line 45 figures 1-5	1-9
X	GB 2 246 656 A (TIMETILL SECURITY LTD) 5 February 1992 (1992-02-05) abstract page 15, paragraph 2 -page 20, paragraph 1	1-9

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
28 August 2001	05/09/2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Van Dop, E

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

ormation on patent family members

Inte al Application No
PCT/GB 01/02238

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 4977583 A	11-12-1990	NONE	
US 5730271 A	24-03-1998	AU 6296296 A	10-02-1997
		CA 2226781 A	30-01-1997
		WO 9703420 A	30-01-1997
US 5975274 A	02-11-1999	NONE	
GB 2246656 A	05-02-1992	AU 8312491 A	02-03-1992
		WO 9202903 A	20-02-1992